

**THE EFFECTS OF INFLATION TARGETING STRATEGY ON THE GROWING  
PERFORMANCE OF EMERGING COUNTRIES**

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**Abstract**

*In a context marked by an overhaul of the monetary theory and the emergence of new monetary policy strategy based on inflation targeting regime, this work is part of monetary policy recently implemented by a set of emerging markets. It focuses on both theoretical and empirical analysis of the inflation targeting regime. At first, it treats the theoretical framework of inflation targeting from the conceptual and analytical aspects that seem complete reflection of the "rule versus discretion" debate. In the context of a simple empirical model, estimated with panel data for 24 emerging markets using both IT and non-IT observations, we find a significant and stable response running from inflation to policy interest rates in emerging markets that are following publically announced IT policies. Similarly, we find that the policy rules for inflation targeting has macroeconomic performance of countries improved by providing a level of low and stable inflation with an economic growth sustainable and non-volatile.*

*Keywords: Inflation targeting, monetary policy, performance, efficiency and stability*

**INTRODUCTION**

Inflation targeting is becoming a standard operating procedure for central banks around the world. By mid 2008, most central banks in the OECD countries (Fourteen of the 30 OECD countries have explicit inflation targets. However, twelve of these countries are in the EMU and operate under a single central bank (ECB). Hence, fourteen of the 19 "operational" central banks in the OECD target inflation and a growing number of developing economies had adopted inflation targeting. There is no international coordination to promote this monetary regime change, and countries do not join an internationally recognized monetary system nor follow common "rules of the game." Adopters of inflation targeting do so primarily because of the framework's perceived success in delivering low and stable inflation.

The theory of monetary policy seems to have been, during the last fifteen years a reformulation of these ancient concepts and the emergence of new foundations dictated by the emergence of the concept of active monetary policy rule centered on the dominance of the objective- inflation targeting.

The conduct of monetary policy based on the concept of the rules is part of the line with the work on the problem of time inconsistency developed by F. Kydland and E.Prescott (1977). These, prefer instead the notion of rules that they opposed to discretionary decisions. This contradiction can be summarized in a maxim: "rule against discretion. This reasoning has been applied, a few years later, by R.Barro and D.Gordon (1983) to the monetary policy. Using a Phillips curve incorporating rational-expectations assumption in the model of R.Lucas (1972), these authors conclude that a discretionary use of monetary policy, challenging the existing rule would be certainly hampered by the reactions of economic agents and would actually produce the opposite effect to that desired. In the presence of asymmetric preferences, the monetary authorities eventually systematically produce inflationary bias and cause "inflation surprises". In the same sense, and in order to complete the "rule-discretion" antinomies, "flexibility-rigidity", recent research on the conduct of monetary policy has resulted in the emergence of the rule of J.Taylor (1993) is the best known simple instrument rule. Thus devolved place to the notion of optimal rule in the conduct of monetary policy is justified by criteria of credibility and transparency in a context where structural changes occur continuously and / or Central Bank is uncertain about the true structure of the economy J. Taylor rule as the beginning of active rules, owes its popularity to the subsequent theoretical clarifications by L.Svenson (1997, 1998, 1999). The latter presents the Taylor rule as a special case of stabilisation in inflation at a level target, his goal whether or not supplemented willingness to cyclical stabilization of activity ("strict" versus "flexible inflation targeting") (Martin 2000).

These theoretical studies are supported by abundant empirical literature to identify the exact forms of optimal rules in order to prove their normative properties. The explicit inflation targeting as an alternative nominal anchor for monetary policy, embodies the 'forward looking' attitude based on the construction of a forecast inflation which emanates from a global structural model. From an operational point of view, this translates into an inclusive approach to all available information.

In practical terms, this revival in the conduct of monetary policy has become a monetary policy increasingly popular and is a global trend with currently twenty five countries had adopted inflation targeting (eight developed countries and seventeen emerging countries). Responding to these developments, it became useful and constructive to focus on the study of a new framework for conducting monetary policy which is the inflation targeting. This work focuses on assessing the experience of emerging countries that have adopted inflation targeting since the

1990s, by focusing on performance as the potential benefits and costs of adopting such a monetary policy framework and try to draw lessons from the twenty years of practice of this regime.

This paper is divided into two main parts. It treats inflation targeting policy and the rule of conduct and the study of efficiency and economic performance under Inflation Targeting. We present in this work analysis of the inflation targeting framework: the definition of this regime and its strategic choices. Particular interest is given to the transparency and credibility of monetary policy as a performance criterion that motivates any country wishing to adopt an inflation targeting regime.

The last axis is to assess and analyse the experiences of a sample of inflation targeting emerging countries. Previous studies such as Aizenman and Nancy (1993), Ramey and Ramey (1996), Martin and Rogers (2001), Stiroh (2008), which support the idea that the measure of environmental stability in monetary policy is based on the measurement of the degree of convergence of interest rates, inflation rates and the gross domestic product (GDP). It will also issue to verify empirically, whether the adoption of this system leads to significant differences in macroeconomic performance, by using the analysis of panel data through the model of Ball and Sheridan (2003) for even the allure of three variables (interest rate, inflation rate and gross domestic product).

## **LITERATURE REVIEW**

### **Inflation targeting in emerging markets**

The theory of inflation targeting has started with Leiderman and Svensson (1995), Svensson (1997, 1998, 1999), Bernanke and Mishkin (1997), Bernanke and al. (1999). It is with these authors first targeting policy definitions have emerged. The first works appeared, during the years four twenty - ten, show some differences in the definition of inflation targeting policy. We begin our analysis by presenting the main definitions of inflation targeting policy, which each show a particular characteristic of this regime. Then we suggest a definition that summarizes the main points that attach to most economists.

Table 1: Summary of some definitions.

Author	Definitions
Leiderman and Svensson (1995)	"The inflation targeting regime has two characteristics: an explicit numerical inflation target by specifying the index, the target level, the tolerance interval, the horizon and the definition of possible situations which the monetary authorities will change the target. . . [And] the absence of an explicit intermediate target such as monetary aggregate target or exchange rate targeting."
Martin and Rogers. (1997)	"Inflation targeting is based on the definition of an explicit inflation target,..." [the definition] clear and unambiguous indications which constitute the overarching objectives leading to the stability of inflation [...]. Method for Inflation Forecasting is to use all information that could provide an indication of future inflation and implement a procedure prospective (forward looking) in order to manage the driving instrument which will depend on the early assessment compared to the predefined target rate. "
Bernanke and Mishkin (1997)	The inflation targeting policy as a new framework for monetary policy analysis which consists of an official announcement from an interval target for one or more horizons. They evoke the uniqueness of the objective: that of price stability. They suggest the explicit announcement of this strategy. In addition, they consider that this policy generates a growth of the degree of communication with the public around the plans and objectives to be implemented.
Mishkin (2000)	Inflation targeting is a monetary policy strategy that encompasses five essential elements: (i) An announcement of a numerical inflation target over the medium term; (ii) an institutional commitment to consider the stability of prices as the overriding objective of monetary policy, which are subordinated the other objectives. (iii) An information strategy in which several variables are used (not not only monetary aggregates, the exchange rate) determining the implementation of the policy instrument. (iv) The increase of the degree of transparency via the communication with the public and the market on plans, objectives and decisions of the monetary authorities. (v) The increase in the responsibility of the Central Bank in order to achieve the inflation targets." A structure of monetary policy designed to redress inflation... The countries pursuing inflation targeting undertake to consider the price stability as their primary objective. They consider inflation as the single nominal anchor on the medium-term."
Capistrán, and Ramos-Francia. (2010)	Defines the inflation targeting policy as a monetary policy strategy aimed at maintaining price stability using all the information available to the Central Bank mainly the prices of financial assets.

Following these definitions, we propose a definition about which there is a consensus. The definition that we develop is similar to that of Bernanke and Mishkin (1999). Indeed, we consider the inflation targeting as a framework for the analysis of monetary policy and not as a simple rule for action on inflation. In other words, its primary objective is to maintain price stability without however excluding the autonomy of monetary authorities to pursue other secondary objectives such as such as stability of the economic activity, the stability of the exchange rate. According to this definition, the success of inflation targeting is based on the respect of certain institutional forms and some strategic choices.

### **Macroeconomic Effects of inflation targeting**

Our empirical work is based on panel-data so as to distinguish between group characteristics, respectively, of the inflation-targeting and non-targeting central banks. We develop an empirical model that investigates the nature of inflation targeting strategies followed in emerging markets.

The comparison of the performance of inflation (level, volatility persistence) in countries adopting inflation targeting regime compared to those practicing other monetary regimes has recently known a particular interest of empirical studies (Mishkin and Posen (1997), Honda (2000), Ball and Sheridan (2003 & 2005), Brito and Bysted (2005), Vega & Winkelried (2005), Brito and Bysted(2006), Mollick and al (2009)). All these studies are based only on individual data, but they significantly different in the choice of control groups of no inflation targeting countries and estimation techniques. Thus, their results were considerably different.

The question of the economic performance of inflation targeting policy is at the heart of the economic debate in recent years. Our objective is attempting to measure economic performance of monetary policy in the economic literature that a stable monetary environment reflects a good macroeconomic performance.

In this section, we focus on the study of the effects of inflation targeting in emerging market countries by the comparative performance of some macroeconomic indicators such as; Inflation, growth, interest rates and exchange rates. The contribution of this study is to extend the earlier literature, comparing the performance of emerging economies pursuing the inflation targeting to those of a group of neighbouring countries with economic indicators developing and comparable social (Table 3). And on the other hand, identify the factors influencing the volatility of inflation in countries adopting this monetary policy and establish the following methodology: The Inflation targeting policy is economically efficient, when it generates an increased degree of stability in the macroeconomic environment. And establish a relationship between stability and performance.

The table 2 illustrates the review of literature since the 1980s, on the relationship between volatility of cycles and economic growth, the main work investigating the effect of

macroeconomic stability on growth; the work identifies a link between the stability of the monetary environment and economic performance through the effect on the determinants of growth.

Table 2: Summary of work identifies a link between the stability of the monetary environment and economic performance through the effect on the determinants of growth.

<i>Studies</i>	<i>Problematic</i>	<i>Methodology</i>	<i>Result</i>
Ho (1996)	What is the effect of monetary instability on economic growth (the accumulation of capital through)?	Monetary instability is measured by the volatility of money growth and the inflation volatility. It adopts an endogenous growth model where the currency is introduced.	High monetary cash creates an increase in the desired level of capital. High inflation generates a reduction in the desired capital.
Beaudry et al. (2001)	What is the impact of monetary instability on economic performance (via the investment rate)?	This effect is studied via the impact of currency instability (measured by the volatility of inflation) on the distribution rate of investment. This study is conducted on English firms during the period 1961-1990.	Monetary policy in an uncertain Environment. The uncertainty of the monetary policy environment negatively affects the distribution rate of investment.
Kormendi and Meguire (1985)	To examine the effect of monetary instability (via the volatility of inflation on economic growth).	The average growth of output as a function of aggregate inflation volatility.	The results were in favor of a negative effect.

The thesis which was supported is that the inflation targeting policy is economically efficient, when it generates a higher degree of stability in the monetary environment.

Stable monetary environment  $\Rightarrow$  low degree of uncertainty  $\Rightarrow$  degree of interaction between the variables high  $\Rightarrow$  convergent responses to shocks Aguir (2014).

## RESEARCH METHODOLOGY

The purpose of this study was to establish the methodology we adopt to assess the economic performance of the inflation targeting policy. We will try in what follows to judge the performance of the inflation targeting policy based on the effect of macroeconomic stability and in particular the environment of monetary policy. In this section we focus on the comparative performance of some macroeconomic indicators. The contribution of this study is to extend the previous literature by comparing the performance of emerging markets pursuing inflation targeting to those of neighboring countries having economic and social indicators comparable. Our study focused on 13 emerging countries practicing the inflation targeting (South Africa, Brazil, Chile, Colombia, Hungary, Indonesia, Mexico, Peru, Philippines, Poland, Romania and the Turkey) and 11 emerging countries practicing other policies monetary (Argentina, Bolivia, Bulgaria, Croatia, Georgia, Jordan, Malaysia, Morocco, Indonesia, Paraguay, Uruguay).

Data was analyzed using descriptive statistics. Further, In order to examine the time-series properties of our data and assess the appropriate estimation methodology panel unit root tests were conducted. This was followed by regressions analysis employing a fixed-effects least-squares estimation procedure (LSDV). It is well known that the LSDV estimation with a lagged dependent variable is biased when the time dimension of the panel (T) is small. Nickell (1981) shows that this bias approaches zero as T approaches infinitely. Judson and Owen (1999), in a Monte Carlo study, shows that the LSDV estimator performs well in comparison with GMM and other estimators when T=30. In an unbalanced panel with T=30, LSDV performs best. T is equal to 68 on our study and the bias is presumably small.

Table 3- Emerging Markets Sample

<b>IT countries</b>	<b>Start of Inflation Targeting Regime</b>	<b>Non-IT countries</b>
Brazil	1999Q1	Argentina
Colombia	1999Q1	Indonesia
Czech Republic	1998Q1	Jordan
Hungary	2001Q1	Malaysia
Israel	1992Q1	Morocco
Korea	1998Q1	Uruguay
Mexico	1999Q1	Paraguay
Peru	1994Q1	Georgia
Philippines	2001Q1	Croatia
Poland	1998Q1	Bulgaria
Thailand	2000Q1	Bolivia
South africa	2000Q1	
Turkey	2006Q1	

Source: Mishkin and Schmidt-Hebbel (2007)

## ANALYSIS & FINDINGS

Table 4 describes the main research variables we examine and their descriptive statistics for our sample of emerging markets. The first column shows the mean and standard deviation for those country-quarter observations in which an inflation-targeting regime was in place. The second column includes the sample of observations consisting of countries who never adopted an IT regime and IT countries before their adoption of an IT regime. GDP growth is virtually the same in the IT and non-IT samples, while inflation is about half of the level on average in IT regimes (5.1 percent) compared to non-IT regimes (9.8 percent). The average level of nominal interest rates is 3.7 percentage points less in the IT sample compared with the non-IT sample, a somewhat smaller difference than the 4.2 percentage point difference in inflation rates between the two regimes, indicating somewhat higher average short-term real interest rates in the IT sample.

The external variables indicate that IT emerging markets appear to experience a substantially higher rate of average depreciation of the real exchange rate and lower rate of international reserve accumulation. This suggests less exchange rate management on the part of the IT countries. Due to the large variability of the sample observations, however, none of these differences are statistically significant using standard thresholds.

In order to examine the time-series properties of our data and assess the appropriate estimation methodology we conduct panel unit root tests.

Table 4– Descriptive Statistics for Macroeconomic Variables

Variable	IT Sample (456 obs.)	Non-IT Sample (577 obs.)
GDP growth (%)	1.11 (5.93)	1.00 (7.84)
GDP gap (%)	-0.11 (3.86)	0.29 (4.62)
Inflation (%)	5.10 (4.21)	9.80 (9.15)
Interest rate (%)	7.92 (6.09)	12.60 (10.25)
Real exchange rate change (%)	2.50 (5.76)	-0.49 (13.27)
Foreign reserve change (%)	3.25 (7.89)	4.66 (22.82)



Table 5 presents the estimates for the benchmark Taylor rule regressions employing a fixed-effects least-squares estimation procedure (LSDV). Column (1) and (4) presents the benchmark model without external variables for the IT and non-IT samples, respectively. The other columns extend the benchmark to the external variables. Columns (2) and (5) combine the benchmark model with the percentage change in the real exchange rate, and columns (3) and (6) combine the benchmark model with the percentage change in international reserve holdings.

The model explains much of the variability in interest rates, with explanatory power ranging from 72-81% (adjusted R<sup>2</sup>). The degree of persistence, measured by the lagged interest rate coefficient, is quite high. The persistence in the IT group is marginally higher than in the non-targeting group. The coefficient on inflation is highly significant, large and stable (with a narrow 0.23-0.29 range) in the inflation-targeting regime but *not* generally in the non-IT regime. Given the estimated impact effects and persistence, the long-term response for the IT targeters to a one percentage point rise in inflation is to increase interest rates by between 1.3-1.8 percentage points. Non-IT policymakers do not respond to inflation rates in the same pronounced and significant way that their IT counterparts do, i.e. the impact response of 0.16 implies a 0.59 percentage point long-term response in the non-IT group. The output gap is not significant in any of the regressions. The output gap is not a significant variable in practically any of the regressions we ran. For robustness, we also estimated the benchmark regressions using the Clarida (2001) specification that includes both contemporaneous and lagged inflation as independent variables. Results on the magnitude of the effect of inflation on the interest rate are practically the same.

The external variables are also very important in distinguishing the operating procedures of the IT and non-IT groups. Both IT and non-IT emerging market central banks respond to real exchange rates in setting interest rates-- the coefficients are large and highly statistically significant. It is noteworthy, however, that the real exchange rate response is much smaller in the IT countries (0.08) compared to the non-IT countries (0.14). The IT group attempts to "lean against the wind" and stabilize the exchange rates by increasing interest rates in response to real exchange rate depreciation, but their actions are apparently more constrained by the commitment to target inflation than the non-IT group in how proactively this objective is pursued. In a similar vein, it is only the non-IT group that takes into account changes in international reserves in setting interest rates. In particular, a one percent increase in reserves leads to a 6 basis point decline in domestic short-term interest rates for non-IT countries (23 basis point long-run effect). Only the non-IT group eases policy in response to international reserve inflows.

Table 5 - Interest Rate Policy Functions: Baseline Model

Variables	IT			Non IT		
	(1)	(2)	(3)	(4)	(5)	(6)
Taux d'intérêt (t-1)	0.84*** (43.97)	0.83*** (43.36)	0.84*** (43.91)	0.76*** (22.50)	0.74*** (22.48)	0.77*** (23.17)
Inflation	0.22* (1.86)	0.29** (2.43)	0.22* (1.86)	0.01 (0.72)	0.15*** (5.08)	0.01 (0.62)
L'écart de production (%)	0.03 (1.05)	0.05 (1.55)	0.03 (1.05)	0.02 (0.37)	0.03 (0.62)	0.02 (0.52)
Taux de change reel		0.07*** (3.46)			0.13*** (5.78)	
Reserve de change						-0.06*** (-3.95)
Observations	387	387	387	472	472	472
R <sup>2</sup>	0.76	0.77	0.76	0.79	0.80	0.73
F-test	272.10	206.89	203.60	177.55	151.01	141.35

\* Sig at 1% , \*\* Sig at 5%, \*\*\* Sig at 10%

*Note: dependent variable: nominal interest rates on the money market. Panel estimation with fixed effect. Statistical tests "t" are shown associated under each coefficient estimation*

## CONCLUSION

The inflation targeting is a monetary policy regime, characterized by an explicit announcement of inflation targeting and the explicit recognition that low inflation is the important long term goals. The theoretical foundations of such a scheme are being thorough. Indeed, much of the literature on the subject was published after the implementation of this policy by the first central banks in developed countries (New Zealand, Canada and the United Kingdom) with the emergence of the J.B. Taylor rule in 1993 and mainly with the development brought to this rule by Lars.O. Svensson (1997, 1998, 1999). This latter approach presents the Taylor rule as a particular case of optimal targeting rule for a Central Bank which pursues an objective of stabilization in the inflation targeting. The implementation of such a regime requires that beforehand, some prerequisites must be met. The theory summarized them as follows:

- A high degree of the Central Bank independence
- An appropriate technical structure
- Stability of the macroeconomic framework
- A developed financial market
- A floating exchange rate regime

-The existence of a stable and predictable relationship between the monetary policy instruments and the inflation and the strategic choices, in the definition of the target, the choice of the range, the target horizon, the press release.

In other words, the use of seignior age revenue as a major source of financing public debt, lack of commitment to price stability as a primary objective for monetary authorities, the excessive intervention of the political authorities and the Central Bank in the foreign exchange market, the lack of a substantial operational independence of the Central Bank and powerful models to forecast inflation affect the operation of any monetary policy that aims at transparency and credibility. Disruption of any credible commitment of the Central Bank sets its reputation to anchor public and market expectations and thus to gain their support and their trust.

In this paper, we explored the nature of inflation targeting in emerging market and transition economies. IT has become a popular operating procedure for many central banks. This is also true in emerging market and transition economies. In the context of an estimated panel data for 24 emerging markets over 1990Q1 to 2013Q4 (using both IT and non-IT observations), we find clear evidence of a significant and stable response running from inflation to policy interest rates in emerging markets that are following publically announced IT policies. By contrast, we find that non-IT central banks place much less weight on inflation in setting interest rates. This observation will allow us to refine our analysis in other works in student exchange policy of emerging inflation targeters and what place must occupy the political policy change in this very specific context of emerging economies with inflation targeting regime.

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